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CYTOTAXONOMIC RESULTS IN AFRICAN LEGUMINOSAE: AN INVENTORY

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Besides morphology, anatomy and — eventually — biochemistry also cytology in the widest sense has been applied as an aid to the evaluation of taxonomic results, although the latter branch often maintains a precarious position due to the degree in which individual taxonomists are inclined to appreciate its applicability.

Linkage of cytology and taxonomy has met with an enormous response in India, witness a continuous flow of publications in the last 20 years. Against many of these may be objected that too often cytological data were collected on uncertified material (e. g. no indication as to source or herbarium specimens). Moreover, all too readily sweeping conclusions have been published with respect to generic or even family relationships, merely based on scanty observations in one or a few species.

During some 50 years extensive research on chromosomal conditions has been made in the Leguminosae, as many taxa have economical significance (e. g. *Trifolium, Vicia, Phaseolus,* etc.). In this respect a few other instances of monographic publications may be mentioned on e. g. *Astragalus* and *Oxytropis* (Ledingham c. s.) and *Cassia* (Turner c. s.). In the last 20 years a number of results have been published on African Leguminosae, mostly accompanied by references as to origin and herbarium sheets stored in official herbaria. Mention may be made of the work of both Mangenot's, my studies on *Indigofera* and a recent joint publication on taxonomic, biochemical and chromosomal results in *Crotalaria* (Frahm-Leliveld a. o.).

Out of curiosity, I recently started a scrutiny in order to determine approximately what has been done and what should be taken up in the matter of cytotaxonomy of the African *Leguminosae,* thereby taking as a basis Brenan's article on geographical relationships of Leguminosae in tropical Africa, published in AETFAT Proceedings of 1963.

Brenan divides the 229 then recognized genera south of the Sahara in 10 groups on a geographical basis, from endemics to bi-areal and several bi- and three-continental groups, the pantropicals and those with a world-wide distribution. He offers an estimation of the approximate number of species in each of the genera at that moment and mentions their geographic distribution. My attempt to make an inventory on the cytological data available lead to the following results.

In tropical Africa there occur 94 endemic genera: 43 of these are mono-specific, 38 have less than 10 species, 8 have 10-20 species, the remaining 5 contain more than 20 recognized species. From 22 genera in all a few data as to chromosome number are known. But from *Humularia* with an estimated number of 40 species nothing is known; the same holds for *Leptoderris* (25-30 spp.) and *Brachystegia* (30 spp.). Quite a number of these endemics are trees of the rainforest, some of them extending into the West African region and owing to the extensive chromosome studies of Prof. MANGENOT and Mrs. MANGENOT we have some information at least; e. g. on *Gilbertiodendron* (26 spp.) and *Anthonotha* (27 spp.), as from each of these two genera chromosome numbers in 3 species have been reported by them.

Proceeding to the non-endemics we meet with a group containing 7 genera which have their main centre in South Africa, the estimated number of species being at least 120 in South Africa and 13 in tropical Africa. There exist 5 reports on chromosome numbers in all, and all of them South African.

The next group, the members of which extend from South Africa to tropical Africa and Europe or Asia — in the latter case only very few species are involved — contains 3 genera with altogether fewer than 200 species and the chromosome reports amount to only 7 in all.

For the time being leaving apart those sections in which the genera are predominantly of temperate origin (chiefly Mediterranean) with a tendency to southward extension into tropical Africa, we now come to 5 genera which are restricted to Africa and Madagascar. Of these, 4 are rather small and in 2 cases chromosome numbers are reported, but the genus *Kotschya* (Africa ± 50 spp. and Madagascar 20—30 spp.) is still "terra incognita" from a cytological viewpoint.

With a view to the geographical distribution and its adherent problems, a more extensive knowledge of chromosomal conditions might be of advantage with respect to the Africa-India section, numbering 5 genera with a rather limited number of species.

The eastern polycontinental section, reaching from Africa via Asia to Australia and Polynesia contains 31 genera. Also here the cytological data are scarce and not seldom even contradictory. Amongst them our curiosity may be directed to the genera *Baphia* (mainly African) and *Flemingia* (mainly Asiatic) and those genera which display a strikingly discontinuous distribution, e. g. *Droogmansia* (no reports), *Bowringia* (one species in Africa with $2n = 22$ chromosomes, and — perhaps? — the same species on the Far-Eastern coasts), *Pericopsis* (no reports) and *Gigasiphon* (no reports).

On the whole, the western polycontinental section is represented in far greater numbers of species in the Americas than in Africa: in this last region a good number of trees have been studied by the MANGENOT's, but from the enormous quantity of American species practically nothing seems to be known.

Closing this summing-up with the many-centred groups, the pantrop-

ical ones and those with a world-wide distribution, everywhere we meet with an inadequate amount of information, even in the best-studied genera the gaps in the cytological knowledge appearing enormous.

Well-designed investigations on well-certified material are an urgent necessity. Such investigations carried out monographically, i. e. on genera or on related generic taxa could certainly extend the insight in taxonomic problems.

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